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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/651,924	08/31/2000	Michael S Bertone	1662-31400 (P00-3212)	4257

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HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER

NGUYEN, DUSTIN

ART UNIT

PAPER NUMBER

2154

DATE MAILED: 06/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/651,924	BERTONE ET AL.	
	Examiner	Art Unit	
	Dustin Nguyen	2154	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 April 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 9-14 and 16-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7, 9-14 and 16-20 is/are allowed.
- 6) ☒ Claim(s) 1-6 and 21-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-7, 9-14, 16-25 are presented for examination.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/24/2006 has been entered.

Claim Objections

3. Claims 9-13 are objected to because of the following informalities: they are dependent on claim 8 which had been previously cancelled, they should depend on claim 7. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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5. Claims 2-6 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A. The following terms lack antecedent basis:

I. the computer system - claims 2-6.

B. As per claim 25, it is not clearly defined the limitation of “returning single credits to the sources in a round-trip manner as space in the buffer becomes free”.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shah et al. [US Patent No 6,347,337], in view of Bechtolsheim et al. [US Patent No 6,515,963].

8. As per claim 21, Shah discloses the invention substantially as claimed including a system, comprising:

a plurality of sources [i.e. plurality of work queues for posting data transfer requests] [col 2, lines 1-2; and col 27, lines 13-15];

a receiver [Abstract; and col 13, lines 3-5];

a buffer accessible to said receiver [col 13, lines 1-19];

wherein said receiver receives requests from said sources [i.e. in response to sender's request for credit update, the Credit Request] [col 18, lines 41-47], the receiver comprising a controller that permits said sources to provide memory requests to said buffer based on credits issued by said receiver to said sources [col 30, lines 38-47] and said receiver automatically issues a credit to a source if a number of filled spaces in said buffer is less than a threshold [Abstract; col 15, lines 36-41] and holds on to a credit if the number of filled spaces is greater than the threshold [i.e. pending] [Abstract; col 15, lines 42-48; and col 16, lines 42-52].

Shah does not specifically disclose

wherein a total number of issued credits to the plurality of sources does not exceed available space in the buffer so the buffer cannot overflow.

Bechtolsheim discloses

wherein a total number of issued credits to the plurality of sources does not exceed available space in the buffer so the buffer cannot overflow [i.e. set the maximum number of buffers is available for each flow] [col 3, lines 13-16; and col 12, lines 36-39].

It would have been obvious to a person skill in the art at the time the invention was made to combine the teaching of Shah and Bechtolsheim because Bechtolsheim's teaching of set the number of buffers available for each flow would have enable flow control to prevent traffic congestion to increase system performance.

9. As per claim 22, Shah discloses wherein each credit corresponds to a single memory request [col 2, lines 1-3].

10. As per claim 23, Shah discloses a buffer adapted to receive a plurality of memory requests from said sources, and said credits are automatically issued to said sources to permit said sources to provide said requests to said buffer [20, Figure 1A; and col 2, lines 12-26].

11. As per claim 24, Shah does not specifically disclose the receiver issues credits among said sources to avoid a source from having exclusive access to said receiver to the exclusion of the other sources. Bechtolsheim discloses the receiver issues credits among said sources to avoid a source from having exclusive access to said receiver to the exclusion of the other sources [i.e. fair allocation and avoid the gross imbalance] [col 10, lines 47-64]. It would have been obvious to a person skill in the art at the time the invention was made to combine the teaching of Shah and Bechtolsheim because Bechtolsheim's teaching would allow to ensure flows to receive fair allocation of bandwidth [Bechtolsheim, col 10, lines 47-49].

12. As per claim 25, Shah discloses wherein when the number of filled spaces in the buffer exceeds the threshold, then returning single credits to the sources in a round-trip manner as space in the buffer becomes free [col 9, lines 23-42; and col 15, lines 26-35].

13. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shah et al. [US Patent No 6,347,337], in view of Bechtolsheim et al. [US Patent No 6,515,963], and further in view of Shimizu [US Patent No 6,715,008], and Deneroff et al. [US Patent No 6,751,698].

14. As per claim 1, it is rejected for similar reasons as stated above in claims 21 and 25.

Furthermore, Bechtolsheim discloses wherein a number of credits assigned to the interprocessor router and the cache control unit is based, at least in part, on round-trip times required to transmit credits between the interprocessor router and the buffer and between the cache control unit and the buffer [col 12, lines 40-65]. Shah and Bechtolsheim do not specifically disclose a plurality of processors, each processor coupled to at least one memory cache, one cache control unit, and one interprocessor router; and a memory coupled to each processor, each memory managed by a memory controller configured to accept memory requests from the plurality of processors; wherein the memory requests from a local processor are delivered to the memory controller by the cache control unit and wherein memory requests from other processors are delivered to the memory controller by the interprocessor router.

Shimizu discloses

a plurality of processors [Figures 1 and 2], each processor coupled to at least one memory cache [204, Figure 2]; and one interprocessor router [220, Figure 2; and col 3, lines 25-48]; and

a memory coupled to each processor [206, Figure 4], each memory managed by a memory controller configured to accept memory requests from the plurality of processors [356, Figure 4]; and

wherein memory requests from other processors are delivered to the memory controller by the interprocessor router [Figure 4; and col 3, lines 66-67].

Shah, Bechtolsheim and Shimizu do not specifically disclose

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one cache control unit, and

wherein the memory requests from a local processor are delivered to the memory controller by the cache control unit.

Deneroff discloses

one cache control unit, and wherein the memory requests from a local processor are delivered to the memory controller by the cache control unit [i.e. directory controller provides cache functions] [col 2, lines 32-40].

It would have been to a person skill in the art at the time the invention was made to combine the teaching of Shah, Bechtolsheim, Shimizu and Deneroff because Deneroff's teaching of cache would allow to reduce communication overhead and increase system performance.

15. As per claim 2, it is rejected for similar reasons as stated above in claim 21. Furthermore, Shimizu discloses wherein:

the interprocessor router are each assigned a number of credits [col 5, lines 56-57];

at least one of said credits must be delivered by the interprocessor router to the memory controller when a memory request is delivered by the interprocessor router to the memory controller [col 5, lines 19-27].

Deneroff discloses

the cache control unit are each assigned a number of credits [col 42, lines 29-32];

at least one of said credits must be delivered by the cache control unit to the memory controller when a memory request is delivered by the cache control unit to the memory controller [col 42, lines 38-67].

It would have been obvious to a person skill in the art at the time the invention was made to combine the teaching of Shah, Bechtolsheim, Shimizu, and Deneroff because Deneroff's teaching would allow to manage buffer and control the flow to prevent traffic congestion.

16. As per claim 3, it is rejected for similar reasons as stated above in claims 21 and 25. Furthermore, Bechtolsheim discloses a round-robin manner [col 2, lines 26-44].

17. As per claim 4, Bechtolsheim discloses the number of credits assigned to the cache control unit and the interprocessor router is sufficient to enable each source to deliver an uninterrupt burst of memory requests to the buffer without having to wait for credits to return from the buffer [i.e. the packet is enqueued without delay] [col 10, lines 6-9].

18. As per claim 5, Shah discloses the number of credits spent by the cache control unit and the interprocessor router are stored and updated in counters located in the shared buffer [i.e. registers] [col 10, lines 62-col 11, lines 9]. Shah and Bechtolsheim do not specifically disclose the number of credits available in the cache control unit and the interprocessor router are stored and updated in counters located in the cache control unit and the interprocessor router. Shimizu discloses the number of credits available in the cache control unit and the interprocessor router are stored and updated in counters located in the cache control unit and the interprocessor router [i.e. credit registers] [302, Figure 3; Abstract; and col 4, lines 1-5]. It would have been obvious to a person skill in the art at the time the invention was made to combine the teaching of

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Shah, Bechtolsheim and Shimizu because Shimizu's teaching would allow to control traffic flow in a more efficient manner.

19. As per claim 6, Bechtolsheim discloses the threshold is the point when the number of free spaces available in the buffer is equal to the total number of credits assigned to the cache control unit and the interprocessor router [col 12, lines 1-18].

20. Applicant's arguments with respect to claims 1-6 and 21-25 have been considered but are moot in view of the new ground(s) of rejection.

21. A shortened statutory period for response to this action is set to expire **3 (three) months and 0 (zero) days** from the mail date of this letter. Failure to respond within the period for response will result in **ABANDONMENT** of the application (see 35 U.S.C 133, M.P.E.P 710.02, 710.02(b)).

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dustin Nguyen whose telephone number is (571) 272-3971. The examiner can normally be reached on flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Follansbee John can be reached on (571) 272-3964. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dustin Nguyen
Examiner
Art Unit 2154

 JOHN FOLLANSBEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100